CLAIMS

1. A synchronous processing circuit for processing signals from an oscillating sensor, wherein the sensor provides a sense signal out of phase with the oscillation and further provides an oscillating signal synchronized to the oscillation of the sensor, the circuit further comprising a scaling circuit for scaling the oscillating signal in response to a first scale factor; and a combining circuit for combining the scaled oscillating signal to the sensed signal.

2. A synchronous processing circuit as in claim 1 wherein the first scale factor is
determined to minimize the error component of the sense signal in-phase with the oscillating signal.

3. A synchronous processing circuit as in claim 1 further comprising a demodulator coupled to demodulate the scaled and combined sense signal with a periodic signal having phase-locked to the oscillating signal.

4. A synchronous processing circuit as in claim 3 wherein the demodulator can selectively operate in phase relative to the oscillating signal and wherein the first scale factor is determined in response to the output from the demodulator.

5. A synchronous processing circuit as in claim 3 further comprising an analog-to-digital converter coupled to rectify and to integrate the demodulated sense signal over an interval synchronized with the oscillating signal.

6. A synchronous processing circuit as in claim 5 wherein the demodulator can selectively operate in phase relative to the oscillating signal and wherein the first scale factor is determined in response to the output from the analog-to-digital converter.

7. A synchronous processing circuit for processing signals from an oscillating sensor, wherein the sensor provides a first and second sense signals out-of-phase with the oscillation, and further provides an oscillating signal synchronized to the oscillation of the sensor, the circuit further comprising a first scaling circuit for scaling the oscillating signal in response to a programmable first scale factor; a second scaling circuit for scaling the oscillating signal in response to a programmable second scale factor, a first combining circuit for combining the first scaled oscillating signal to the first sensed signal, and a second combining

circuit for combining the second scaled oscillating signal to the second sensed signal.

8. A synchronous processing circuit as in claim 7 wherein the first and second scale factor are determined so as to minimize the error component of the sense signals in-phase with the oscillating signal.

9. A synchronous processing as in claim 8, the circuit further comprising a third scaling circuit for scaling the first sense signal in response to a third scale factor; and a fourth scaling circuit for scaling the second sense signal in response to a fourth scale factor, wherein the first combining circuit further combines the scaled second sense signal to the first sensed signal, and the second combining circuit combines the scaled first sense signal to the second sensed signal.

10. A synchronous processing circuit as in claim 9 further comprising two demodulators, one coupled to demodulate each of the combined sense signals with a periodic signal phase-locked to the oscillating signal.

11. A synchronous processing circuit as in claim 10 wherein the demodulators can selectively operate in phase relative to the oscillating signal and wherein the first scale factor is determined in response to the output from the demodulator coupled to receive combined first sense signal and the second scale factor is determined in response to the output from the demodulator coupled to receive the combined second sense signal.

12. A synchronous processing circuit as in claim 10 further comprising two analog-to-digital converters, one coupled to rectify and to integrate the demodulated first sense signal over an interval synchronized with the oscillating signal and the other coupled to rectify and to integrate the demodulated second sense signal over an interval synchronized with the oscillating signal.

13. A synchronous processing circuit as in claim 12 wherein the demodulators can selectively operate in phase relative to the oscillating signal and wherein the first scale factor is determined in response to the output from the analog-to-digital converter coupled to receive combined and demodulated first sense signal and the second scale factor is determined in response to the output from the analog-to-digital converter coupled to receive the combined and demodulated second sense signal.

14. A method for processing signals from an oscillating sensor, wherein the sensor provides a sense signal out of phase with the oscillation and further provides an oscillating signal synchronized to the oscillation of the sensor, the method including the steps of scaling the oscillating signal in response to a first scale factor; and combining the scaled oscillating signal to the sensed signal.

15. A method for processing signals from an oscillating sensor as in claim 14 further comprising the step of determining the first scale factor to minimize the error component of the sense signal in-phase with the oscillating signal.

16. A method for processing signals from an oscillating sensor as in claim 14 further comprising the step of demodulating the scaled and combined sense signal with a periodic signal having phase-locked to the oscillating signal.

17. A method for processing signals from an oscillating sensor as in claim 16 further including the step of selectively demodulating the scaled and combined sense signal with a periodic signal having phase in quadrature relative to the oscillating signal and wherein the step of determining the first scale factor is responsive to the output from the demodulating step.

18. A method for processing signals from an oscillating sensor, wherein the sensor provides a first and second sense signals out-of-phase with the oscillation, and further provides an oscillating signal synchronized to the oscillation of the sensor, the method comprising the steps of scaling the oscillating signal in response to a programmable first scale factor; scaling the oscillating signal in response to a programmable second scale factor, combining the first scaled oscillating signal with the first sensed signal, and combining the second scaled oscillating signal with the second sensed signal.

19. A method for processing signals from an oscillating sensor as in claim 18 further comprising the steps of determining the first and second scale factor so as to minimize the error component of the sense signals in-phase with the oscillating signal.

20. A method for processing signals from an oscillating sensor as in claim 19 further comprising the steps of scaling the first sense signal in response to a third scale factor; scaling the second sense signal in response to a fourth scale factor, wherein the one step of combining further combines the scaled second sense signal to the first sensed signal, and the other step of combining combines the scaled first sense signal to the second sensed signal.